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# Kinetic Sand Media to improve Pre-writing in Children with Spastic Type of Cerebral Palsy

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**Abstract:** This study is based on the problems found in SLB 1 Padang Panjang. There is a child with spastic type of cerebral palsy (CP) had low pre-writing ability, this was indicated by the child's difficulty in moving his muscles, so that the child experienced difficulties in the academic field in his writing ability. The purpose of this study is to improve children's pre-writing skills by using kinetic sand for spastic types of cerebral palsy. The method used is single subject research (SSR) with an ABA design. The test uses a pre-writing ability test, which is to assign children to make horizontal, vertical lines, right and left slashes, curved lines up, down, right and left, write the letters c, i, n, v, z, and write their nicknames. The results of data analysis obtained are in A1 with observations for four days of children in pre-writing. the results are 28%. In state B, the child was given an action in his pre-writing ability using kinetic sand media with the implementation for seven days, the result was 78%. Then on A2 carried out for four days without any further treatment using kinetic sand media, the results were 78%. Based on the results of this study indicates that kinetic sand media can improve pre-writing skills in children with cerebral palsy.

**Keywords:** Kinetic sand media; pre-writing skills; children with cerebral palsy.

## INTRODUCTION

Guidance and counseling service is a service provided for an individual in a systematic and continuous process, conducted by the expert to help the individual understand themselves and their environment, adjust themselves to their environment, and develop their potential for their better well-being and society (Salahudin, 2010). Children with special needs or children who are often known to be different in general, such as children who have physical, sensory, mental, and neuromuscular abnormalities. One of the children who experience physical barriers is cerebral palsy, a very complex brain damage that occurs during and after birth, which causes sensory center disorder. Cerebral palsy based on its movements can be classified into types of spastic, athetoid, ataxia, tremor, rigid, and based on the number of paralysis of the limbs (Iswari & Nurhastuti, 2010).

Children with spastic cerebral palsy will find it difficult to control the body's reflexes because the nerve muscles that control reflexes are disturbed. So that this causes children to be unable to move their body muscles optimally and have jerky movements, so children need special exercises that can help develop fine motor skills to help carry out daily activities optimally. This fine motor development is related to small muscles. This causes children to experience difficulties in their pre-writing activities.

Pre-writing ability is an activity that introduces to support children's writing ability. In this pre-writing ability begins with simple writing activities such as: making horizontal lines, vertical lines, oblique lines, and curved lines. Pre-writing in children with cerebral palsy can aim as a way to introduce writing correctly and can train and optimize children's ability to write letter symbols. A medium is called educational media when the medium transfers messages in a learning process (Hasan et al., 2021).

Based on a preliminary study conducted at SLB N 1 Padang Panjang, the authors observed a 14-year-old boy with cerebral palsy in class III/C SLB with the initials M. Based on the observations made, children are classified as spastic type cerebral palsy, this is characterized by difficulty moving the muscles to move due to muscle spasms. So that children experience difficulties in the academic field in their writing abilities. This is marked by the results of children's writing that cannot be read well in writing letters. The pre-writing skills of children with spastic cerebral palsy still need training in improving their pre-writing skills to support activities in their academic field, namely writing skills. Efforts to help improve the pre-writing ability of children with cerebral palsy can be done by using kinetic sand media. Kinetic sand media is media in the form of artificial sand formed with various colors that children like (Dayanti, 2019). Kinetic sand media is able to train fine motor skills in the muscles of a child's fingers before the child starts writing on paper and pencil. Children can learn to recognize letter shapes by copying letters written with their fingers on the sand (Muthiah, 2020). Using kinetic sand media, children can write freely on the sand, for example, writing lines such as horizontal lines and writing letter symbols, this can move their hands freely so that they can stimulate their pre-writing skills. In accordance with what was stated by Kuntarto (2013), pre-writing begins with an activity when the child pretends to write on the sand in the form of scratches until the child can imitate the actual form of writing. So that these activities are not boring for children because can learn while playing. Special guidance and education is needed according to the needs to optimize the language and its potential (Kustawan Dedi & Yani, 2013). The purpose of this study is to improve children's pre-writing skills by using kinetic sand for spastic types of cerebral palsy.

In 2017, the Ministry of Research, Technology, and Higher Education published Regulation of the Minister of Research, Technology, and Higher Education Number 46 Year 2017 about special education and education with special services as an attempt to provide equal access and opportunity to education for all children (Bendová & Fialová, 2015). The collaboration among teachers and other related parties is expected to solve the problems encountered by students with special needs in an inclusive education setting (Fitri & Iswari, 2022). Several ways to use kinetic sand media according to (Rufaida & Reza, 2013), as follows: Activities that can be carried out by playing sand between teachers and children include: (a) The teacher gives time to interact with other children, (b) Choose materials, (c) The teacher gives examples of scribbling in the sand, (d) The teacher gives examples of how to draw, (e) Animal shapes in the sand, (f) The teacher gives examples of how to print models of objects in the sand, (g) The teacher gives examples how to form sand, (h) Children follow the teacher's example, and (i) Children try to mold and shape sand as they wish. Based on the elaboration above, in improving children's pre-writing skills using kinetic sand media, it can be described in steps (Muthiah, Sumardi & Rahman, 2020), as follows:

a. Letting children feel the texture of the sand gives a pleasant sensation before starting writing activities.
b. Give examples of how to make meaningful doodles in the sand
c. Let the child have a learning experience by making meaningful doodles in the sand
d. Give examples of how to write letters in the sand
e. Let the children feel the experience of learning to write letters in the sand

## METHOD

The research was conducted using a quantitative approach to the experimental type in the form of Single-Subject-Research (SSR) with ABA design. The first phase (A1) is the condition when the intervention has not been given, the second phase (B) is the phase when the intervention is given to the subject, and the third phase (A2) is the phase where there is a change after the intervention is no longer given (Prahmana, 2014). The data collection technique used is the action test. The action test that will be given to children is the pre-writing ability test. The data collection tool used is the pre-writing ability instrument collection format. This pre-writing ability instrument is used at baseline

A1 is the initial condition of pre-writing ability before being given the intervention, in the intervention that is the condition of the child's pre-writing ability when given treatment using kinetic sand media, and in the baseline condition A2, namely the condition of the child's pre-writing ability when it is no longer given treatment. Then to measure the results of the child's behavior test using a percentage measuring tool.

## FINDING AND DISCUSSION

This research was conducted in 15 meetings in each phase, namely A1-B-A2. Phase A1 consists of four meetings, phase B consists of seven meetings, and phase A2 consists of four meetings. Each phase is carried out until stable data results are achieved.

Baseline A1, namely the initial ability of children in pre-writing with indicators of making horizontal lines, vertical lines, slashes to the right, slashes to the left, curved lines up, curved lines down, curved lines to the right, curved lines to the left, writes the letters c, i, n, v, z and write own nickname. At the first meeting, the child's score was 21%, at the second to fourth meeting, the child's score was 28%.

Intervention phase (B), in which children are given treatment using kinetic sand media for pre-writing skills. First the children are introduced to kinetic sand media, then the children are given the freedom to observe and feel the texture of kinetic sand, after that the children are guided to make free streaks on the kinetic sand, then the children are guided to make horizontal, vertical, slanted to the right, left slanted, curved lines. up, curve down, curve right, curve left on the kinetic sand, then the children are guided to write the letters c, i, n, v, z on the kinetic sand and after that the children are guided to write their own name on the kinetic sand. The results of the children's scores at the intervention stage were the first meeting 42%, the second meeting 50%, the third meeting 64%, the fourth meeting 71%, and the fifth to seventh meeting 78%.

Baseline A2, namely the condition of the child not being given any further treatment after the intervention, the child's ability to pre-write the result score, namely the first meeting is 71%, the second to fourth meeting is 78%. The results of the analysis of the data that have been obtained can be seen in the following graph for clarity, as follows:


**Figure 1.** Comparison of the results of data A1, B, A2 in children's pre-writing abilities

Based on the results of observations that pre-writing skills in children with cerebral palsy have developed well.

**Table 1.** Summary of Data in Conditions

| No | Condition | A1 | B | A2 |
|---|---|---|---|---|
| 1 | Condition Length | 4 | 7 | 4 |
| 2 | Directional Trend Estimation | | | |
| 3 | Stability trend | 75%<br>Unstable | 28.57%<br>Unstable | 100%<br>Stable |
| 4 | Data Footprint Trends | + | + | + |
| 5 | Stability Level and Range | Variable 21%-28% | Variable 42%-78% | Stable 71%-78% |
| 6 | Change Levels | 28%-21%=7%<br>increased (+) | 78%-42%=36%<br>increased (+) | 78%-71%=7%<br>increased (+) |

Based on the results of research that has been carried out in 15 meetings in three phases, namely A1, B and A2, it is proven that kinetic sand media can improve the pre-writing ability of children with cerebral palsy. Kinetic sand media uses the muscles of a child's fingers in its use so that it is able to train the muscles of the child's fingers to be smooth, so that later it has an effect on improving pre-writing abilities in children, which is in accordance with Muthiah's opinion (2020) that kinetic sand media is able to train fine motor skills in the muscles the child's fingers before the child starts writing on paper and pencil. Children can learn to recognize letter shapes by copying letters written with their fingers on the sand. Based on the results of this study, kinetic sand media can improve pre-writing skills in children with cerebral palsy at SLB 1 Padang Panjang.

## CONCLUSION

Based on the results of the research conducted and the data obtained, it can be concluded that kinetic sand media can influence the improvement of pre-writing skills for children with spastic type cerebral palsy class III/C at SLB 1 Padang Panjang. This is evident from the graphical analysis and calculation of the data that has been obtained. The graph shows the pre-writing ability of children with cerebral palsy through kinetic sand media. In accordance with the data from the results of the study, it was concluded that the pre-writing ability for children with spastic type cerebral palsy when using kinetic sand media and after no longer using kinetic sand media the results increased and the data obtained was stable. Thus the kinetic sand media has an effect on improving pre-writing abilities for children with cerebral palsy.

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